2.0 BACKGROUND INFORMATION

2.1 Site Description

The Upriver Dam PCB Site (the Site) is located along the Spokane River in the County of Spokane, Washington, east-northeast of the City of Spokane. The Site consists of the areal extent of sediments hydraulically influenced by the Upriver Dam at river mile (RM) 80. Upriver Dam facility is owned and operated by the City of Spokane. The Site extends upstream of the dam to approximately RM 85 near the Centennial Trail footbridge and Plante's Ferry Park. Elevated levels of PCBs have been found in isolated sediment deposits within the Site. A general map of the Site location is provided in Figure 1. The Spokane River is also part of a large Superfund site which extends into Northern Idaho and is covered by the EPA 2002 Record of Decision (ROD) for the Spokane River and the Coeur d'Alene Basin. The river has been listed under CERCLA due to elevated levels of heavy metals including: zinc, cadmium, lead and arsenic.

2.2 Site History

The Spokane River is a large river which drains more than 4,900 square miles of land in both Washington and Idaho. The Spokane River watershed includes areas in the Northern Rocky Mountain and Columbia River ecoregions. The river flows through an urbanized and industrialized basin and is downstream of the City of Coeur d'Alene, Idaho. Mining operations, industries, and municipal wastewater treatment plants located within the watershed have discharged PCBs, heavy metals and wood waste into the river system. The river transported these contaminants and sediments contaminated with these materials downstream where they have settled in the depositional area created by the Upriver Dam.

The Dam, first constructed in 1894, altered the natural flow of the river creating a low-energy impoundment area which serves as a depositional area for sediment traveling down the river. The river was originally a free-flowing system subject to seasonal variations in flow with high-water/ high-flow events that periodically redistributed sediment deposits to more downstream locations. The Dam has stabilized the system creating an impoundment area in which contaminated sediments have been deposited over time. Background investigations, discussed in Section 2.4, have characterized contaminated sediment deposits in the upper reaches of the river. The EPA has identified a 17-acre area, upstream of the Upriver Dam, containing sediment deposits with elevated levels of heavy metals (EPA 2001). EPA's Coeur d'Alene Basin Remedial Investigation/Feasibility Study focused on heavy metal contamination in the Basin without specifically addressing PCB-contaminated sediment deposits located upstream of the Spokane River Upriver Dam. Ecology, as the lead agency responsible for overseeing the cleanup of PCBs on the Spokane River, initiated the characterization of sediment deposits containing PCBs in the impoundment area.

This FCAP addresses the PCB-containing sediments found within the Site boundaries. A partial failure of the Dam occurred in May 1986. While water overtopped the spillway gates and caused considerable erosion of earthen-dam material downstream of the dam, there was no indication that significant erosion occurred upstream of the spillway gates in the impoundment area. Radioisotope profiling of sediment cores from the PCB-contaminated deposits suggest that these sediments in the impoundment are stable, and there is no indication of substantial widespread scouring and remobilization. While PCB-contaminated sediments at the Site targeted for

cleanup have been generally stable, the deposits act as a source, or potential source, of dissolved PCBs to the overlying water column.

In 2001, the Spokane Regional Health District issued a PCB fish consumption advisory for areas along the length of the site. Analyses of tissues from rainbow trout, mountain whitefish, and large scale suckers revealed that PCB levels in three species of fish inhabiting the river were substantially above levels considered safe for human consumption. It was determined that it was unsafe to eat any rainbow trout or mountain whitefish caught in the upper Spokane River between the Upriver Dam and the Washington/Idaho state line. The Spokane Regional Health District determined that meals of large-scale suckers should be limited to one meal per month and specific preparation methods should be employed to limit consumption of tissue known to accumulate PCBs. The PCB advisory was updated in 2003 to include tissue analyses from Long Lake (Lake Spokane).

PCBs were produced between 1929 and 1977 in the United States. They were used in a wide variety of products including capacitors, transformers, hydraulic fluids, plasticizers, adhesives, cutting oils, sealants, caulks and inks. Known sources of PCBs to the Upriver Dam area of the Spokane River include: the Spokane Industrial Park, whose historic discharge was located at approximately RM 87 and which was formerly owned and operated by Pentzer Development Corporation, a corporation of which Avista is a successor; the Kaiser Trentwood Works (Trentwood) located at approximately RM 86 and owned and operated by Kaiser; Liberty Lake Sewage Treatment Plant (RM 92); and the Inland Empire Paper Company paper plant at approximately RM 83. Two distinct fine-grain sediment deposits, containing PCBs, have been located within the Site in areas owned by the City of Spokane, the Washington Department of Natural Resources (DNR), and the Washington Department of Parks & Recreation.

2.3 Administrative Background

In certified correspondence dated May 31, 2001, Ecology notified Liberty Lake Sewer & Water District of the preliminary finding of potential liability and requested comment on those findings. Similarly, on June 1, 2001, Ecology notified Kaiser and Avista of the preliminary finding of potential liability and requested comment on those findings. Inland Empire Paper was notified via certified correspondence of the preliminary finding of potential liability on December 17, 2001. On December 12, 2001, Ecology notified Kaiser, Avista, and Liberty Lake Sewer & Water District of their status as "potentially liable persons" (PLPs) under Chapter 70.105D.040 RCW for the release of hazardous substances at the Site. Similarly, on April 30, 2003, Inland Empire Paper was notified of their status as "potentially liable persons" under Chapter 70.105D.040 RCW for the release of hazardous substances at the Site.

In 2002, Ecology negotiated with Kaiser and Avista to complete a Remedial Investigation (RI)/Focused Feasibility Study (FS) as required under MTCA. The RI is to determine the nature and extent of contamination and the FS is to evaluate cleanup alternatives for the Site. Effective February 6, 2003, Ecology entered into a Consent Decree with Avista and Kaiser, while the Liberty Lake Sewer & Water District and Inland Empire Paper opted not to participate. The Consent Decree set forth requirements for completing a focused RI/FS of PCBs in sediments at the Site. Ecology's selection of cleanup activities, detailed in this FCAP, were based on the results of the RI and FS and account for concerns raised during the 45-day public comment period on the RI/FS and the draft version of this Cleanup Action Plan.

The documents used to make the decisions documented in this FCAP are part of the administrative record for the Site. To review the RI and the FS or to obtain copies at an established cost, contact Ms. Carol Bergin at (509) 329-3546. (See Section 1.4 Administrative Record)

2.4 Background Site Investigations

Numerous other physical and chemical analyses have previously been performed on sediments located in the Upriver Dam impoundment area. These investigations include:

- Ecology's 1993-94 Investigations (Ecology 1995)
- Kaiser's 1994 Investigations (Hart Crowser 1995)
- Ecology's 1999 Survey (Johnson 2000)
- Ecology's 2000 Sediment Toxicity Tests (Johnson and Norton 2001)
- EPA's 2001 Coeur d'Alene Basin Remedial Investigation/Feasibility Study (EPA 2001)
- Avista's and Kaiser's 2001 Investigation (Exponent and Anchor 2001)
- Avista's and Kaiser's 2005 Focused Remedial Investigation Report, Upriver Dam PCB Sediments Site (Anchor Environmental RI February 2005)
- Avista's and Kaiser's 2005 Focused Feasibility Study, Upriver Dam PCB Sediments Site (Anchor Environmental FS February 2005)

These Site investigation reports are available in the administrative record for the Site, as discussed in Section 1.3. Brief summaries of the site investigation data are provided in the sections below.

2.5 Site Physical Characteristics

2.5.1 Site Sediments

Sediment and sediment-bound contaminants within the Spokane River are transported downstream and deposited in impoundments along its length including the Upriver Dam impoundment area. The sediment sources to the upper Spokane River include remobilization of channel bed material, bank erosion, and tributary inputs. Although Lake Coeur d'Alene provides a low energy environment where much of the sediment derived from upstream watershed and former mining sources is deposited, some silts and clay remain suspended through the lake and enter the Spokane River. Fine-grain suspended sediments travel downstream, binding with contaminants including PCBs originating from both point and non-point sources, and settle in downstream depositional areas.

The upstream end of the Upriver Dam impoundment, at approximately RM 85 near Plante's Ferry Park, is approximately 17 miles downstream of the Post Falls Dam at RM 101.7. Even under seasonal low flow conditions, stream velocity between Post Falls and Plante's Ferry Park is generally high enough that sands and finer-grained materials do not appreciably settle in this area beyond small, localized deposits. However, below Plante's Ferry Park, within the Upriver Dam impoundment, river velocity slows considerably, particularly during seasonal low flow conditions and within the relatively wide and deep reach of the river immediately upstream of the Upriver Dam at RM 79.8. Settling of fine-grained sediments and organic matter occurs within such lower energy environments resulting in the accumulation of sediments and organic

sediment-bound contaminants such as PCBs. Similarly, sediment deposits contaminated by mining-related metals from Idaho have been identified by the EPA in the 170-acre Upriver Dam impoundment

2.5.2 Site Groundwater (Hydrogeology)

The Site is located within the Spokane Valley Rathdrum Prairie Aquifer, a major regional water supply source. The aquifer is unconfined and composed of coarse-grained glacial outwash deposits. Typical deposits include sand, gravel, and boulders, with minor amounts of silt and clay. Regional groundwater flow is generally to the west, following the river basin.

Groundwater flow directions in the vicinity of Upriver Dam are influenced by water impounded behind the dam. The pool behind the dam has an approximate elevation of 1,910 feet (mean sea level; MSL) while the river elevation below the dam is approximately 1,880 feet MSL. This results in localized surface water exfiltration from the reservoir to the aquifer. Regional groundwater flow patterns resume downstream from the dam, with groundwater flow generally following the river basin. Groundwater elevation data collected by Spokane County from nearby monitoring wells confirm this finding (Stan Miller personal communication 2003). The most complete data sets covering the spring runoff and fall low flow periods were used to develop the groundwater contours. Lower gradients and the regional westward flow with discharge to the river appear to be restored within approximately ½ to 1 mile west of the dam. The presence of visible seepage discharges on both sides of the river within ½ mile of the dam, particularly at locations immediately below the dam and powerhouse, provides additional evidence of localized return flows.